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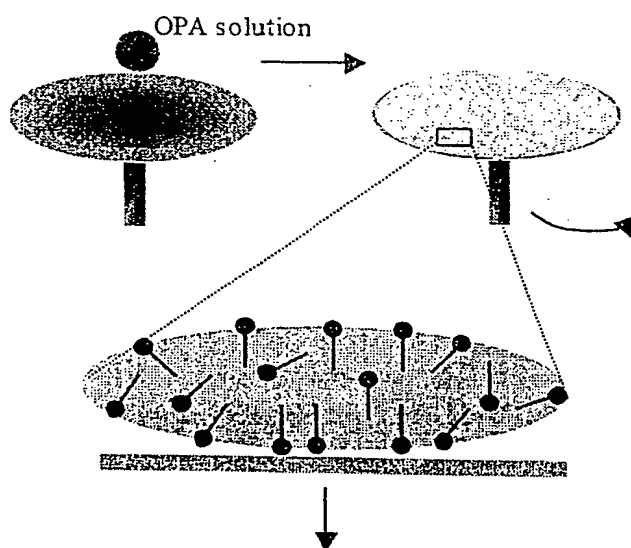
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(54) Title: METHOD OF CONTROLLABLE MORPHOLOGY OF SELF-ASSEMBLED MONOLAYERS ON SUBSTRATES



(57) Abstract: Method of controlling the morphology of  
self-assembled monolayers (SAMS) on substrates having  
hydrophilic surfaces. The hydrophilic surface is exposed to a  
fluid having a mixture of molecules which can self-assemble  
on the hydrophilic surface and hydrophobic molecules which  
can self-assemble on the hydrophobic surface to form a complete  
self-assembled monolayer. In a particular embodiment  
octadecylphosphonic acid (OPA) molecules have been  
self-assembled on oxidized substrates including but not  
limited to mica, silicon, sapphire, quartz and aluminum by  
spin-coating a solution containing the octadecylphosphonic  
acid (OPA) molecules and hydrophobic molecules such  
as chloroform or trichloroethylene under a controlled  
relative humidity. Control of the morphology of OPA  
SAMS is affected by adjusting humidity and the duration of  
spin-coating. Atomic force microscopy revealed that relative  
humidity has a profound influence on the morphology of the  
OPA SAMS formed. When sufficient molecules are applied  
either consecutively or separately, the final morphology will  
be a complete monolayer, regardless of the relative humidity.